

Line 10, please change "decompression" to -vacuum-.

Line 11, please change "decompressed" to -evacuated-.

Line 20, please change "decompression" to -vacuum-.

Line 25, please change "decompression" to -vacuum-.

In the claims:

Please cancel claim 30 in its entirety without prejudice.

Please amend the claims as follows:

23.(Amended) A film forming method comprising:

[a first step of] supplying a hydrogen gas into a chamber;

[a second step of] supplying radio frequency energy in said chamber to generate plasma from said hydrogen gas by radio frequency discharge;

[a third step of] supplying a [silicon containing gas] reactive gas into said chamber;

and

[a fourth step of] forming [an amorphous film comprising silicon] a semiconductor film comprising amorphous silicon in said chamber by decomposing said [silicon containing gas] reactive gas using said radio frequency energy,

wherein the step of supplying [a] said hydrogen gas is discontinued [simultaneously] with a start of the step of supplying [a silicon containing gas] said reactive gas so as not to change a total amount of said reactive gas and said hydrogen gas in said chamber and throughout the forming of [an amorphous film comprising silicon] said semiconductor film comprising amorphous silicon.

24.(Amended) A film forming method comprising:

[a first step of] forming a silicon oxide film on a substrate by plasma chemical vapor deposition;

[a second step of] supplying a hydrogen gas into a chamber;

[a third step of] supplying radio frequency energy in said chamber to generate plasma from said hydrogen gas by radio frequency discharge;

[a fourth step of] supplying a [silicon containing gas] reactive gas into said chamber; and

[a fifth step of] forming [an amorphous film comprising silicon] a semiconductor film comprising amorphous silicon on said silicon oxide film in said chamber by decomposing said [silicon containing gas] reactive gas using said radio frequency energy,

wherein the step of supplying [a] said hydrogen gas is discontinued [simultaneously] with a start of the step of supplying [a silicon containing gas] said reactive gas so as not to change a total amount of said reactive gas and said hydrogen gas in said chamber and throughout the step of forming [an amorphous film comprising silicon] of said semiconductor film comprising amorphous silicon.

25.(Amended) A film forming method comprising:

[a first step of] forming [an amorphous film comprising silicon] a semiconductor film comprising amorphous silicon in a chamber by decomposing a [silicon containing gas] reactive gas using radio frequency energy;

[a second step of] supplying a hydrogen gas into said chamber; and

[a third step of] supplying radio frequency energy to said hydrogen gas to generate plasma from said hydrogen gas in said chamber by radio frequency discharge,

wherein said [silicon containing gas] reactive gas is supplied into said chamber during the step of forming of [an amorphous film comprising silicon] said semiconductor film comprising amorphous silicon before the step of supplying [a] said hydrogen gas, and the step of supplying [a] said hydrogen gas is started [simultaneously] with discontinuing a

supply of said [silicon containing gas] reactive gas so as not to change a total amount of said reactive gas and said hydrogen gas in said chamber.

26.(Amended) A film forming method comprising:

[a first step of] supplying a discharge gas into a chamber;

[a second step of] supplying radio frequency energy in said chamber to generate plasma from said discharge gas by radio frequency discharge;

[a third step of] supplying a [silicon containing gas] reactive gas into said chamber;
and

[a fourth step of] forming [an amorphous film comprising silicon] a semiconductor film comprising amorphous silicon in said chamber by decomposing said [silicon containing gas] reactive gas using radio frequency energy,

wherein the step of supplying [a] said discharge gas is discontinued [simultaneously] with a start of the step of supplying [a silicon containing gas] said reactive gas so as not to change a total amount of said reactive gas and said discharge gas in said chamber and throughout the step of forming [an amorphous film comprising silicon] of said semiconductor film comprising amorphous silicon, and

wherein said discharge gas does not contribute to film formation [by itself].

27.(Amended) A film forming method comprising:

[a first step of] forming [an amorphous film comprising silicon] a semiconductor film comprising amorphous silicon in a chamber by decomposing a [silicon containing gas] reactive gas using radio frequency energy;

[a second step of] supplying a discharge gas into said chamber; and

[a third step of] supplying radio frequency energy to said discharge gas to generate plasma from said discharge gas in said chamber by radio frequency discharge,

wherein said [silicon containing gas] reactive gas is supplied into said chamber during

the step of forming [an amorphous film comprising silicon] of said semiconductor film comprising amorphous silicon before the step of supplying a discharge gas, and the step of supplying [a] said discharge gas is started [simultaneously] with discontinuing supplying said [silicon containing gas] reactive gas so as not to change a total amount of said reactive gas and said discharge gas in said chamber, and

wherein said discharge gas does not contribute to film formation [by itself].

28.(Amended) A film forming method for forming a plurality of different films in a multilayer in a multichamber apparatus comprising a plurality of chambers coupled to each other, said method comprising:

[a first step of] supplying a hydrogen gas into one of said chambers;

[a second step of] supplying radio frequency energy in said one of said chambers to generate plasma from said hydrogen gas by radio frequency discharge;

[a third step of] supplying a [silicon containing gas] reactive gas into said one of said chambers; and

[a fourth step of] forming [an amorphous film comprising silicon] a semiconductor film comprising amorphous silicon as one of said different films in said one of said chambers by decomposing said [silicon containing gas] reactive gas using radio frequency energy therein,

wherein the step of supplying [a] said hydrogen gas is discontinued [simultaneously] with a start of the step of supplying [a silicon containing gas] said reactive gas so as not to change a total amount of said reactive gas and said hydrogen gas in said chamber and throughout the step of forming [an amorphous film comprising silicon] of said semiconductor film comprising amorphous silicon, and wherein each of said chambers forms at least one of said plurality of different films. [in a multilayer.]

29.(Amended) A film forming method for forming a plurality of different films in a

Sub
file
cont'd
1
ent

multilayer in a multichamber apparatus comprising a plurality of chambers coupled to each other, said method comprising:

[a first step of] forming [an amorphous film comprising silicon] a semiconductor film comprising amorphous silicon as one of said different films in one of said chambers by decomposing a [silicon containing gas] reactive gas using radio frequency energy;

[a second step of] supplying a hydrogen gas into said one of said chambers; and

[a third step of] supplying radio frequency energy to said hydrogen gas to generate plasma from said hydrogen gas in said one of said chambers by radio frequency discharge,

wherein said [silicon containing gas] reactive gas is supplied into said chamber during the step of forming [an amorphous film comprising silicon] of said semiconductor film comprising amorphous silicon before the step of supplying [a] said hydrogen gas, and the step of supplying [a] said hydrogen gas is started [simultaneously] with discontinuing the supplying of said [silicon containing gas] reactive gas so as not to change a total amount of said reactive gas and said hydrogen gas in said chamber, and wherein each of said chambers forms at least one of said plurality of different films.

31.(Amended) A method according to claim 23 wherein said [amorphous film comprising silicon] semiconductor film comprising amorphous silicon is crystallized by a laser light, and the crystallized film is used for thin film transistor.

32.(Amended) A method according to claim 24 wherein said [amorphous film comprising silicon] semiconductor film comprising amorphous silicon is crystallized by a laser light, and the crystallized film is used for thin film transistor.

33.(Amended) A method according to claim 25 wherein said [amorphous film comprising silicon] semiconductor film comprising amorphous silicon is crystallized by a laser light, and the crystallized film is used for thin film transistor.

34.(Amended) A method according to claim 26 wherein said [amorphous film comprising silicon] semiconductor film comprising amorphous silicon is crystallized by a laser light, and the crystallized film is used for thin film transistor.

35.(Amended) A method according to claim 27 wherein said [amorphous film comprising silicon] semiconductor film comprising amorphous silicon is crystallized by a laser light, and the crystallized film is used for thin film transistor.

36.(Amended) A method according to claim 28 wherein said [amorphous film comprising silicon] semiconductor film comprising amorphous silicon is crystallized by a laser light, and the crystallized film is used for thin film transistor.

37.(Amended) A method according to claim 29 wherein said [amorphous film comprising silicon] semiconductor film comprising amorphous silicon is crystallized by a laser light, and the crystallized film is used for thin film transistor.

45.(Amended) A method according to claim 23 wherein a period of time from start of said radio frequency discharge of [said second step to] said start of the supply of said [silicon containing gas] reactive gas is 10 seconds.

46.(Amended) A method according to claim 24 wherein a period of time from start of said radio frequency discharge of [said third step to] said start of the supply of said [silicon containing gas] reactive gas is 10 seconds.

47.(Amended) A method according to claim 28 wherein a period of time from start of said radio frequency discharge of [said second step to] said start of the supply of said [silicon containing gas] reactive gas is 10 seconds.

Sub 13
Gmt
48.(Amended) A method according to claim 23 wherein a time chart in said film forming is $10t \geq T$ where t is a largest period of time selected among periods of time corresponding to an unstable discharge state at a start of discharge, and where T is a period of time of the forming of said [amorphous film comprising silicon] semiconductor film comprising amorphous silicon.

49.(Amended) A method according to claim 24 wherein a time chart in said film forming is $10t \geq T$ where t is a largest period of time selected among periods of time corresponding to an unstable discharge state at a start of discharge, and where T is a period of time of the forming of said [amorphous film comprising silicon] semiconductor film comprising amorphous silicon.

50.(Amended) A method according to claim 26 wherein a time chart in said film forming is $10t \geq T$ where t is a largest period of time selected among periods of time corresponding to an unstable discharge state at a start of discharge, and where T is a period of time of the forming of said [amorphous film comprising silicon] semiconductor film comprising amorphous silicon.

Please add new claims 51-103 as follows:

D4
~~--51. A method according to claim 23 wherein the step of supplying said hydrogen gas is discontinued simultaneously with a start of the step of supplying said reactive gas.~~

52. A method according to claim 24 wherein the step of supplying said hydrogen gas is discontinued simultaneously with a start of the step of supplying said reactive gas.

53. A method according to claim 25 wherein the step of supplying said hydrogen

gas is started simultaneously with discontinuing a supply of said reactive gas.

54. A method according to claim 26 wherein the step of supplying said discharge gas is discontinued simultaneously with a start of the step of supplying said reactive gas.

55. A method according to claim 27 wherein the step of supplying said discharge gas is started simultaneously with discontinuing supplying said reactive gas.

56. A method according to claim 28 wherein the step of supplying said hydrogen gas is discontinued simultaneously with a start of the step of supplying said reactive gas.

57. A method according to claim 29 wherein the step of supplying said hydrogen gas is started simultaneously with discontinuing the supplying of said reactive gas.

58. A method for fabricating a thin film transistor comprising a semiconductor layer having at least a channel formation region, a gate insulating film adjacent to said semiconductor layer, and a gate electrode adjacent to said gate insulating film, said method comprising the steps of:

- supplying a discharge gas into a chamber;
 - supplying radio frequency energy in said chamber to generate plasma from said discharge gas by radio frequency discharge;
 - supplying a reactive gas into said chamber; and
 - forming said gate insulating film over an insulating substrate in said chamber by decomposing said reactive gas using said radio frequency energy,
- wherein said discharge gas is not supplied during the step of supplying said reactive gas and throughout the forming of said gate insulating film.

Sub 37
D4
Cot

59. A method according to claim 58 wherein said thin film transistor is a bottom gate thin film transistor.

60. A method according to claim 58 wherein said gate insulating film is made of silicon oxide.

61. A method according to claim 58 wherein said discharge gas is hydrogen.

62. A method according to claim 58 wherein said reactive gas is silane.

63. A method according to claim 58 wherein a period of time from the start of said radio frequency discharge to the start of the supply of said reactive gas is 10 seconds.

64. A method for fabricating a thin film transistor comprising a semiconductor layer having at least a channel formation region, a gate insulating film adjacent to said semiconductor layer, and a gate electrode adjacent to said gate insulating film, said method comprising the steps of:

forming said gate insulating film over an insulating substrate in a chamber by decomposing a reactive gas using radio frequency energy;

supplying a discharge gas into said chamber; and

supplying radio frequency energy to said hydrogen gas to generate plasma from said hydrogen gas in said chamber by radio frequency discharge,

wherein said reactive gas is supplied into said chamber during the step of forming of said gate insulating film before the step of supplying said discharge gas, and said reactive gas is not supplied during the step of supplying said discharge gas.

65. A method according to claim 64 wherein said thin film transistor is a bottom

gate thin film transistor.

66. A method according to claim 64 wherein said gate insulating film is made of silicon oxide.

67. A method according to claim 64 wherein said discharge gas is hydrogen.

68. A method according to claim 64 wherein said reactive gas is silane.

69. A method according to claim 64 wherein said radio frequency discharge is continued for 15 seconds after supplying said discharge gas.

70. A method for fabricating a thin film transistor comprising a semiconductor layer having at least a channel formation region, a gate insulating film adjacent to said semiconductor layer, and a gate electrode adjacent to said gate insulating film, said method comprising the steps of:

supplying a discharge gas into a chamber;

supplying radio frequency energy in said chamber to generate plasma from said discharge gas by radio frequency discharge;

supplying a reactive gas into said chamber; and

forming said semiconductor layer comprising amorphous silicon over an insulating substrate in said chamber by decomposing said reactive gas using said radio frequency energy,

wherein said discharge gas is not supplied during the step of supplying said reactive gas and throughout the forming of said semiconductor layer comprising amorphous silicon.

71. A method according to claim 70 wherein said thin film transistor is a bottom

gate thin film transistor.

Sub 7
72. A method according to claim 70 wherein said discharge gas is hydrogen.

73. A method according to claim 70 wherein said reactive gas is silane.

74. A method according to claim 70 wherein a period of time from the start of said radio frequency discharge to the start of the supply of said reactive gas is 10 seconds.

Sub 9
75. A method according to claim 70 wherein a thickness of said semiconductor layer is 50 nm or less.

Sub 7
76. A method for fabricating a thin film transistor comprising a semiconductor layer having at least a channel formation region, a gate insulating film adjacent to said semiconductor layer, and a gate electrode adjacent to said gate insulating film, said method comprising the steps of:

134 cont
forming said semiconductor layer comprising amorphous silicon over an insulating substrate in a chamber by decomposing a reactive gas using radio frequency energy;

supplying a discharge gas into said chamber; and

supplying radio frequency energy to said hydrogen gas to generate plasma from said hydrogen gas in said chamber by radio frequency discharge,

wherein said reactive gas is supplied into said chamber during the step of forming of said semiconductor layer comprising amorphous silicon before the step of supplying said discharge gas, and said reactive gas is not supplied during the step of supplying said discharge gas.

77. A method according to claim 76 wherein said thin film transistor is a bottom

gate thin film transistor.

78. A method according to claim 76 wherein said discharge gas is hydrogen.

79. A method according to claim 76 wherein said reactive gas is silane.

80. A method according to claim 76 wherein said radio frequency discharge is continued for 15 seconds after supplying said discharge gas.

81. A method according to claim 76 wherein a thickness of said semiconductor layer is 50 nm or less.

82. A method for fabricating a thin film transistor comprising, a semiconductor layer having at least a channel formation region, a gate insulating film on said semiconductor layer, and a gate electrode adjacent on said gate insulating film, said method comprising the steps of:

supplying a discharge gas into a chamber;
supplying radio frequency energy in said chamber to generate plasma from said discharge gas by radio frequency discharge;
supplying a reactive gas into said chamber; and
forming an under film on an insulating substrate in said chamber by decomposing said reactive gas using said radio frequency energy,
wherein said discharge gas is not supplied during the step of supplying said reactive gas and throughout the forming of said under film.

83. A method according to claim 82 wherein said under film is made of silicon oxide.

84. A method according to claim 82 wherein said discharge gas is hydrogen.

85. A method according to claim 82 wherein said reactive gas is silane.

86. A method according to claim 82 wherein a period of time from the start of said radio frequency discharge to the start of the supply of said reactive gas is 10 seconds.

87. A method for fabricating a thin film transistor comprising, a semiconductor layer having at least a channel formation region, a gate insulating film on said semiconductor layer, and a gate electrode on said gate insulating film, said method comprising the steps of:
forming an under film on an insulating substrate in a chamber by decomposing a reactive gas using radio frequency energy;

supplying a discharge gas into said chamber; and

supplying radio frequency energy to said hydrogen gas to generate plasma from said hydrogen gas in said chamber by radio frequency discharge,

wherein said reactive gas is supplied into said chamber during the step of forming of said under film before the step of supplying said discharge gas, and said reactive gas is not supplied during the step of supplying said discharge gas.

88. A method according to claim 87 wherein said under film is made of silicon oxide.

89. A method according to claim 87 wherein said discharge gas is hydrogen.

90. A method according to claim 87 wherein said reactive gas is silane.

91. A method according to claim 87 wherein said radio frequency discharge is continued for 15 seconds after supplying said discharge gas.

Sub E13 7
92. A method for fabricating a thin film transistor comprising a semiconductor layer having at least a channel formation region, a gate insulating film adjacent to said semiconductor layer, and a gate electrode adjacent to said gate insulating film, said method comprising the steps of:

supplying a discharge gas into a chamber;

supplying radio frequency energy in said chamber to generate plasma from said discharge gas by radio frequency discharge;

supplying a reactive gas into said chamber; and

forming said semiconductor layer comprising an amorphous silicon and said gate insulating film over an insulating substrate in said chamber by decomposing said reactive gas using said radio frequency energy,

wherein said discharge gas is not supplied during the step of supplying said reactive gas and throughout the forming of said semiconductor layer and said gate insulating film.

93. A method according to claim 92 wherein said thin film transistor is a bottom gate thin film transistor.

Sub E14 7
94. A method according to claim 92 wherein said discharge gas is hydrogen.

95. A method according to claim 92 wherein said reactive gas is silane.

96. A method according to claim 92 wherein a period of time from the start of said radio frequency discharge to the start of the supply of said reactive gas is 10 seconds.

97. A method according to claim 92 wherein a thickness of said semiconductor layer is 50 nm or less.

98. A method for fabricating a thin film transistor comprising a semiconductor layer having at least a channel formation region, a gate insulating film adjacent to said semiconductor layer, and a gate electrode adjacent to said gate insulating film, said method comprising the steps of:

forming said semiconductor layer and said gate insulating film over an insulating substrate in a chamber by decomposing a reactive gas using radio frequency energy;

supplying a discharge gas into said chamber; and

supplying radio frequency energy to said hydrogen gas to generate plasma from said hydrogen gas in said chamber by radio frequency discharge,

wherein said reactive gas is supplied into said chamber during the step of forming of said semiconductor layer and said gate insulating film before the step of supplying said discharge gas, and said reactive gas is not supplied during the step of supplying said discharge gas.

99. A method according to claim 98 wherein said thin film transistor is a bottom gate thin film transistor.

100. A method according to claim 98 wherein said discharge gas is hydrogen.

101. A method according to claim 98 wherein said reactive gas is silane.

102. A method according to claim 98 wherein said radio frequency discharge is continued for 15 seconds after supplying said discharge gas.